

WHAT IS CLAIMED IS:

1. A power-on reset circuit for generating a reset signal according to a voltage of a power source, the power-on reset circuit comprising:
an oscillator coupled to the power source for generating an oscillation signal
5 having an oscillation frequency that increases as the voltage of the power source increases;
a frequency detector coupled to the power source and the oscillator for outputting a corresponding first output voltage according to the oscillation frequency of the oscillation signal; and
10 a reset signal generator for generating the reset signal according to the first output voltage.
2. The power-on reset circuit according to claim 1, wherein the oscillator is a ring oscillator.
3. The power-on reset circuit according to claim 2, wherein the ring oscillator
15 comprises a plurality of inverters connected in series to form a ring cascade, and the number of the inverters is an odd number greater than one.
4. The power-on reset circuit according to claim 1, wherein the oscillator is a voltage-controlled oscillator.
5. The power-on reset circuit according to claim 1, wherein the frequency
20 detector comprises:
a current source coupled to the power source;
a first capacitor having a first terminal coupled to the current source, and a second terminal that is grounded;

- a second capacitor having a first terminal grounded and a second terminal;
a first switch coupled to a first terminal of the first capacitor and the second
terminal of the second capacitor; and
a second switch connected in parallel to the second capacitor;
5 wherein the first output voltage is output from the first terminal of the first
capacitor.
6. The power-on reset circuit according to claim 5, wherein the first switch and
the second switch are controlled by the oscillation signal, the second switch is
OFF when the first switch is ON, and the second switch is ON when the first
10 switch is OFF.
7. The power-on reset circuit according to claim 5, wherein the magnitude of the
first output voltage is inversely proportional to the oscillation frequency of the
oscillation signal.
8. The power-on reset circuit according to claim 5, wherein the current source is a
15 resistor.
9. The power-on reset circuit according to claim 1, wherein the power-on reset
circuit is utilized to reset a digital circuit.
10. The power-on reset circuit according to claim 1, wherein the reset signal output
circuit is a comparator circuit.
- 20 11. The power-on reset circuit according to claim 10, wherein the comparator
circuit is coupled to the frequency detector and outputs the corresponding reset
signal according to the first output voltage and a second output voltage,
wherein the reset signal is enabled when the first output voltage is greater than

the second output voltage, and the reset signal is disabled when the first output voltage is smaller than the second output voltage.

12. The power-on reset circuit according to claim 11, wherein the magnitude of the second output voltage is in fixed proportion to the voltage of the power source.
- 5 13. The power-on reset circuit according to claim 12, further comprising a voltage divider to generate the second output voltage.
14. The power-on reset circuit according to claim 13, wherein the voltage divider comprises:
 - a first resistor coupled to the power source; and
 - 10 a second resistor having a first terminal coupled to the first resistor and a second terminal that is grounded;wherein the second output voltage is output from the first terminal of the second resistor, and the magnitude of the second output voltage is determined by resistances of the first resistor and the second resistor.
- 15 15. The power-on reset circuit according to claim 1, wherein the reset signal output circuit is an inverter for outputting the reset signal according to the first output voltage.
16. A power-on reset method applied to a power-on reset circuit, the power-on reset circuit including an oscillator, a frequency detector, and a comparator, the
20 method comprising the steps of:
 - receiving a voltage of a power source;
 - providing a corresponding oscillation signal according to the voltage of the power source;

outputting a corresponding first output voltage according to the oscillation
signal;

comparing the first output voltage to a second output voltage for generating a
comparing signal; and

5 outputting a reset signal according to the comparing signal;

wherein the second output voltage is proportional to the voltage of the power
source.

17. The power-on reset method according to claim 16 wherein the oscillation
10 signal has an oscillation frequency that increases as the voltage increases

18. The power-on reset method according to claim 16 wherein the first output
voltage is determined by a mathematical function inversely proportional to an
oscillation frequency of the oscillation signal.